

Appl. No. 10/657,057
Attorney Docket No.: 2003B093
Amdt. dated November 7, 2005
Reply to Office Action of Oct. 20, 2005

REMARKS/ARGUMENTS

Claim Amendments

By the amendments presented, Claims 1, 9, 17, 25, 33, 37, 41, 45, 92, 100, 108, 112, 116, 122, 128, 134, 140, and 146 are rewritten to indicate that the matrix element of the claims is a "clay or clay-type" matrix. Support for these amendments is found in the original specification in Paragraph 0062 on Page 21.

Upon entry of the claim amendments presented, Claims 1-151 remain in the application. No additional claim fee is due as a result of the claim amendments made.

Invention Synopsis

The present invention is directed to the preparation and use of novel, molecular sieve-based, oxygenate-to-olefins conversion catalysts which minimize formation of undesirable, metal-catalyzed, side-reaction by-products that can form during oxygenate conversion. Such catalyst compositions are prepared using clay-based binder materials which contain less than specified very low amounts of certain metals including iron, titanium, nickel, cobalt, manganese and vanadium. The presence of catalytic amounts of these metals in oxygenate conversion catalysts has been identified as the cause of the production of efficiency-diminishing by-products in the oxygenate conversion process. Accordingly, elimination or minimization of these metals in oxygenate conversion catalysts improves the overall cost effectiveness of the oxygenate conversion, e.g., methanol-to-olefins, processes in which these low-metal catalysts are used.

Restriction Requirement

The Examiner has subjected the present application to a restriction requirement under 35 USC §121 by identifying the following two claim groups:

Group I. Claims 1-48 and 92-151, drawn to a catalyst composition, and method of making such a composition, classified in Class 502, subclass 214; and

Group II. Claims 49-92 [actually 91], drawn to a process for making olefins, classified Class 585, subclass 640.

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The Examiner contends that restriction is proper because the "inventions" of Groups I and II are "distinct" and have "acquired a separate status in the art." Applicants respectfully traverse this restriction requirement.

The claims of the two identified groups are related to each other as composition/method-of-making and method-of-use. Accordingly, whether or not the inventions of such claim groups are properly characterized as "distinct", prosecution of claims of these two types in a single application is permitted unless an undue searching burden would be placed upon the PTO in conducting a patentability search with respect to all of these claims.

Notwithstanding the Examiner's assertion of differing classifications and "separate status in the art," it is submitted that any prior art search set up for Group I should at least be overlapping with any search for Group II. When one is looking for art relating to the minimization or elimination of an element from a composition to avoid some undesired effect which that element causes in use, one must look in the relevant method-of-using classifications. Furthermore, for most of the Group II claims (Claims 53-91), the nature of the molecular sieve-based catalyst compositions (i.e., the Group I catalysts) used in the claimed olefin-making process is an essential element of the process claims and is, in fact, the principal novel feature of these process claims. So the search for the Group I claims and Claims 53-91 of Group II should be exactly the same. Given this situation, it is submitted that it cannot be properly concluded that searching both claim groups together would present an "undue" searching burden for the Examiner.

In view of the foregoing remarks, it is respectfully requested that the Examiner reconsider and withdraw, or at least modify, the requirement for restriction and allow Claims 1-151, or at least Claims 1-48 and 53-151, to be prosecuted in the same application as directed by MPEP §803. Notwithstanding the above arguments and the request for reconsideration, in the event the Examiner's restriction requirement is made final, Applicants hereby confirm the previously made provisional election to prosecute the claims of Group I (Claims 1-48 and 92-151), holding Claims 49-91 (Group II) in abeyance under the provisions of 37 CFR §1.142(b) until final disposition of the elected claims.

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Art Rejections

Rejection Over Martens et al

Claims 1-48 and 92-151 have been rejected under 35 USC §102(b) as allegedly being anticipated by Martens et al. (U.S. Patent 6,440,894, hereinafter "Martens"). The Examiner contends that the Martens disclosure of oxygenate conversion catalysts containing the same molecular sieves and clay matrix materials as those which the Applicants list as being suitable for inclusion in the instantly claimed catalysts would anticipate the rejected claims. The metal content elements of the rejected claims are said to be inherent in the reference-disclosed materials since the names of the disclosed materials used are the same as those set forth in the instant application. Such a rejection over Martens is respectfully traversed as it would apply to Claims 1-48 and 92-151 as amended herein.

The Martens patent discloses molecular sieve-based oxygenate conversion catalysts which have been treated to remove halogen material contained in the catalyst. It is noted that halogens such as chlorine are frequently introduced via binders such as aluminum chlorhydrat and that there are benefits provided by removing this chlorine material via calcination. Martens also discloses that the catalyst can additionally contain clay binders. Listed clays include "kaolins, commonly known as Dixie, McNamee, Georgia and Florida clays, or others in which the main mineral constituent is holosite, kaolinite, dickite, nacrite, or anauxite." There is no disclosure in Martens of the metal content of any of the disclosed clays, and it is this silence concerning metal content which brings about this Section 102 rejection on an "inherent anticipation" theory.

It is, of course, well established that anticipation by inherent disclosure is appropriate only when the reference discloses prior art that must necessarily include the unstated limitation. [Cf. Transclean Corp. v. Bridgewood, 62 USPQ 2d 1865 (CAFC, 2002)] This and many other CCPA and CAFC cases have emphasized that the anticipatory inherent feature or result must be consistent, necessary and inevitable, not merely possible or probable. In the instant situation, it is submitted that Applicants' claimed requisite metal content is not such an inevitable inherent feature of the disclosed clay materials in Martens, notwithstanding the similarity of the generic names or tradenames used to characterize the clay materials involved.

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As noted in Applicants' specification in Paragraphs 0071 and 0072, clay materials such as the preferred kaolins listed in both the instant application and in the Martens reference can vary widely in metal, e.g., iron, content depending upon region of origin and even from deposit to deposit within a given region. It is noted that analytical analysis of metal content may be needed to determine whether a particular clay sample has a sufficiently low metal content for use as a matrix material according to the present invention. Even in providing a list of exemplary suitable clays (including the Dixie, McNamee, Georgia, and Florida clays also listed by Martens), the instant specification cautions that such materials may be used as matrix materials in the catalysts of the present invention only "so long as the particular sample has the low metal contents claimed herein."

With respect to those metal types which have been found to undesirably catalyze by-product formation and which, accordingly, are to be held within specified concentration limits in the clay matrix materials used herein, it is noted that the concentrations of these metals in the matrix materials to be used can be determined via analysis through well-known techniques. Such techniques include inductively coupled plasma atomic emission spectroscopy (ICP/AES), atomic adsorption spectroscopy (AAS) and/or x-ray fluorescence (XRF). Inasmuch as such analysis is frequently necessary to make the selection of low-metal matrix materials from the various sources of the clay materials available, it is apparent that the feature of maintaining the several listed metals within the specified concentration limits is not something which is simply inherent and inevitable in selecting clay matrix materials by clay type, point of origin, or tradename.

Given the foregoing considerations, it is respectfully submitted that the Martens patent does not anticipate the catalyst composition and process-of-making claims herein because this reference neither expressly nor inherently discloses clay matrix materials having Applicants' specified limits on content of the various recited problematic metals. Accordingly, it is further submitted that continued rejection of these claims over the Martens reference under 35 USC §102 would be improper.

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Rejection over Kibby et al.

Claims 1-3, 5-11, 13-19, 21-27, 29-32, 92-94, 96-102, 104-107, 116-119, 121-125, 127-131, 133-137, 139-143, 145-149, and 151 have been rejected under 35 USC §102(b) as allegedly being anticipated by Kibby et al. (U.S. Patent 5,939,349, hereinafter "Kibby"). The Examiner contends that Kibby anticipates the rejected claims by virtue of the Kibby disclosure of catalysts comprising molecular sieves and metal oxide matrix materials prepared as cogels which contain no source of any of the various metals minimized in Applicants' claims. Such a rejection over Kibby is also respectfully traversed as it would apply to the rejected claims as amended herein.

Kibby discloses a method for preparing dewaxing catalysts comprising non-zeolitic molecular sieves and a hydrogenation catalyst component. These sieve and hydrogenation components may, optionally, be combined with binary or ternary inorganic oxide materials serving as a matrix. Such inorganic oxide matrix materials are prepared as cogels precipitated from a synthesis mixture. There is no disclosure in Kibby of any catalyst compositions containing matrix materials which are, or are derived from, clays.

It is clear that the matrix materials used to form the Kibby catalysts are synthetically prepared inorganic oxides and are not clay-based materials. Kibby thus fails to anticipate the instant claims as amended because it does not disclose catalysts which contain clay-based material as now required by Applicants' claims. It should also be noted that Kibby fails to disclose those rejected claims which put upper limits on the amounts of nickel, cobalt, or titanium within the claimed catalyst composition. Kibby, in fact, discloses just the opposite by requiring the presence of a catalytic amount of a hydrogenation component which can be any of these three specific metals.

Given the foregoing considerations, it is respectfully submitted that the Kibby patent does not anticipate the rejected catalyst composition and process-of-making claims herein because this reference fails to disclose one and in some cases two of the essential elements of the amended claims. Accordingly, it is further submitted that continued rejection of such amended claims over the Kibby reference under 35 USC §102 would be improper.

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CONCLUSION

Applicants have made an earnest effort to place their application in proper form, to establish the unity of their invention and to distinguish their claimed invention from the applied prior art. WHEREFORE, reconsideration of this application, entry of the amendments presented, withdrawal or modification of the restriction requirement, withdrawal of the claim rejections under 35 USC §102, and allowance of the amended claims presented, are all respectfully requested.

Any comments or questions concerning the application can be directed to the undersigned at the telephone number given below.

Respectfully submitted,

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